certainly not simultaneous between Kew and Lisbon. The abrupt disturbances constituting magnetic storms are, however, probably simultaneous all over the world. It is thus possible to imagine the former or rounded disturbances to be caused by convection currents, but it is quite impossible to regard the latter as so caused. How, then, can these be accounted for consistently with this hypothesis? We reply, that when there is a considerable disturbance in the convection currents of the earth, these currents, as we have explained, conveying electricity, we may then expect such currents to influence and alter the magnetism of the earth. The earth gets out of relation as a magnet to these currents, and rights itself abruptly; and this abrupt change of the earth occurring simultaneously all over it, may form the second kind of magnetic storm.

Corresponding to these two varieties of magnetic disturbances, we have, in all probability, two kinds of auroras.

The upper convection currents of the earth, if they convey electric currents, may probably be self-luminous, and this may account for auroras of a local nature, and perhaps also for the nearly perennial displays of auroras near the magnetic pole.

On the other hand, whenever we have an abrupt magnetic storm we have the production of secondary currents due to the small but abrupt changes taking place in the magnetism of the earth, and these secondary currents will manifest themselves both in the upper strata of the earth's crust, which are conductors, and in the upper strata of the earth's atmosphere, which are also conductors. In the former case they will produce violent earth-currents; in the latter they will produce a magnificent auroral display, cosmical rather than local in its characteristics.

We have already alluded to the Greenwich self-recording instruments for registering earth-currents, and the author of this notice has inspected several of the curves given by the Greenwich instruments during violent magnetic storms. The characteristic of these traces is an abrupt and violent change from positive to negative and from negative to positive. Now, this is a behaviour quite in accordance with the hypothesis that these are secondary currents due to magnetic changes, but quite inconsistent with the hypothesis that they are themselves the causes of such changes.

Altogether, we would venture to conclude, *firstly*, that if the changes of terrestrial magnetism are not due to some such cause as that which we have stated, then they must be due to some cause of which we are entirely ignorant; and, *secondly*, that the laws of the magnetic changes are, in all the points we have examined, consistent with the idea that they are due to the carriage of conductors across the earth's lines of force.

B. STEWART

SIMON'S "SPIDERS OF FRANCE"

Les Arachnides de France. Par Eugène Simon, Vice-Président de la Société Entomologique de France. Tome premier. (Paris, 1874.)

EXCEPTING two or three, either partial or abortive, attempts at the early part of the present century, by Baron Walckenäer, no effort has, until now, been made to supply a history of the spiders indigenous to France. This is the more remarkable, inasmuch as, though Arachnology has but few votaries in any country, yet England, Sweden, Prussia, and even Italy, have furnished more or less complete works on their respective spider-faunas. Looking again at the geographical position of France, perhaps few other equal areas would give such a promise of rich results to the araneologist; with all the advantages of an insular position, France combines those of the general Continent of Europe; and her climate ranges from the sub-arctic, in her mountain regions, to the semi-tropical on the Mediterranean shores. We may confidently, therefore, expect a vast addition to our knowledge of European spiders from the labours of the industrious author who has stepped into the breach, and whose first volume on the Spiders of France stands at the head of this notice.

As its title implies, the work is intended to embrace more than the one order (Araneidea) of Arachnids; certainly (it is understood) the orders Scorpionidea and Phalangidea; but whether it will extend also to the other orders, is yet undecided. The present volume, pp. 1-269, Pl. i. ii. iii., embraces five families of the order Araneidea (or Araneæ). It is a matter of regret that it had not been practicable to retain a systematic sequence in regard to the details of the order; the reason given for this is that the author has taken first those families of which he was in possession of the amplest materials; another drawback also seems to be, that the Introduction, "comprising general remarks on the class Arachnida and its bibliography," will not appear until later; when it will, however, be specially paged for addition to the first volume. The volume before us begins with a useful glossary of special terms used in the descriptions; to this follow (pp. 5-15) some general remarks on the characters of the order ARANEÆ, and some criticisms on the more extended works of different authors upon it; concluding with the outlines of the classification adopted in the present work. In regard to classification but little alteration is proposed from that contained in a paper, "Aranéides nouveaux ou peu connus du Midi de l'Europe, 2e mémoire," by the author,* published (according to the title-page of its author's presentation copies) in 1873, in "Mémoires de la Société Royale des Sciences de Liége."

For the principles of M. Simon's primary divisions of the Araneidea we are referred to the second memoir above mentioned; there, after giving his reasons for dissenting from the primary divisions adopted by Dr. Thorell in his work "On European Spiders," the author divides the Araneidea into four sub-orders:—1. THERAPHOSÆ; 2. GNAPHOSÆ; 3. ARANEÆ; 4. OCULATÆ. The sequence of these is reversed in the volume before us; the name of the third is changed to *Araneæ veræ*, and of the fourth to *Araneæ oculatæ*. The addition to the name of the third order was necessitated by the adoption of the term Araneæ

* This paper does not, however, appear yet to have been "published" in the only true acceptation of the term; that is, *offered to the public for sale*; and, it is understood, will not be so published until 1875. This is in some respects a matter of importance, inasmuch as the claim of many species and some genera to the names under which they are, or will be, characterised in the present work, rests for their priority upon the date of publication of the above paper in the Mém. Liége. Similar remarks apply to the 1e Mémoire on "Aranéides du Midi de l'Europe," the presentation copies of which were issued in 1870, while the volume containing it was not published until 1873.

(Sundevall) as the name of the whole order, in lieu of Araneidea—Aranćides. With regard to this change, it has the opinion and authority of Dr. Thorell in its favour; and something may be said for it on its own merits; but still, similar terminations (such as in the present instance the ordinal termination -eidea, in the class Arachnida), when adopted for the designation of parallel groups in nature, are of considerable use in fixing the necessary framework of classification in the mind. The grouping, however, of the different families in M. Simon's four sub-orders will, we may anticipate, hardly find much favour among araneologists. The "Araneæ veræ" form an exceedingly heterogeneous group, including as it does spiders so widely separated as the Thomisides and Pholcides! The "Gnaphosæ," also, consisting only of the Dysderides and Scytodides, comprise two very distinct groups, with little in common except the number of the eyes, and the mode of adaptation of the palpal organs to the digital joints of the male palpi; characters found also among the "Araneæ veræ," as well as among the "Theraphosæ."

With respect to the distinguishing characters given of the sub-orders "Araneæ veræ" and "Araneæ oculatæ" (*Yeux diurnes* and *Yeux nocturnes*)—the former coloured and convex, the latter vitreous and flattened—some detailed proof of these differences producing the results asserted would seem to be necessary. Differences, indeed, there are between the eyes of various spiders: some are undoubtedly flattened, some misshapen, and, as in the genus *Œcobius*, apparently more or less aborted; some also are of a pearly-white lustre, some dark, and others brilliantly coloured; but that the eyes of spiders may be distinguished as nocturnal or diurnal by the presence or absence of colour, is an idea at least opposed to the views of an eminent insect anatomist, M. F. Müller, who, as long ago as 1826, "Zur Vergleichenden Physiologie des Gesichtssinnes," wrote against M. Marcel de Serres in regard to a similar point among insects. Apart, however, from this point, it would seem scarcely necessary to attempt the very difficult task of dividing into sub-orders a group so homogeneous as the order Araneidea.

The linear arrangement of the families adopted by M. Simon is very natural, and the interpolated names of his Sub-orders appear to be of little assistance as mere divisional marks, while their scientific tenability seems also, as hinted above, very questionable. M. Simon, while attributing confusion of mind to Dr. Thorell (Note 1 to p. 10) in regard to his notions respecting Orders and Families, appears to have himself fallen into some confusion in regard to the difference between Orders and Sub-orders; in the note above quoted these two kinds of groups are spoken of as though of equal significance in classification, and as being similarly characterised. An Order, however (characterised by complications of structure common to all the families of which it is composed), limits a group within a CLASS; while the Sub-order limits a group within the Order; a group distinguished differentially from the Order by some special complications of structure peculiar to itself. Each of M. Simon's four Sub-orders should, consistently with his definition of those groups, be based "Sur un caractére anatomique profond, indépendant de la forme, mais indiquant une supériorité ou une infériorité dans les limités de la classe." When we turn, however, to the characters given (in the Mémoire before quoted), we find some considerable details given under each of the Sub-orders; but the special anatomical character indicating the superiority or inferiority of each is not apparent. If the difference between *Yeux diurnes* and *nocturnes* be the character intended, no mention is made of it in respect to the Theraphosæ, while the *Araneæ veræ* possess eyes of both kinds, "the two central eyes of the first row are diurnal, the other six nocturnal." And even supposing these characters to be good and constant, it is not easy to see what superiority or inferiority is indicated by them. All recent investigation tends to lessen the value of characters taken merely from the eyes of spiders, for higher divisional purposes. Supposing they are so, all we could say is, that they are modified and adapted to the habits of the different spiders, and are thus, at most, valuable for *specific* determinations.

Passing on to the body of the work, we find good terse descriptions of 131 species of spiders distributed among the six families—Epëiridæ, Uloboridæ, Dictynidæ, Enyoidæ, and Pholcidæ; the genera comprised in these being twenty-three in number. The genus *Epëira* absorbs thirty-nine out of the seventy-four species contained in the whole family EPËIRIDÆ, the remainder being distributed as follows:—*Peltosoma*, 2; *Argiope*, 2; *Cyrtophora*, 1; *Cyclosa*, 5; *Larinia*, 2; *Singa*, 8; *Cercidia*, 1; *Zilla*, 6; *Meta*, 3; *Tetragnatha*, 5. In the family ULOBORIDÆ are four species distributed between two genera: *Uloborus*, 3; *Hyptiotes*, 1. The family DICTYNIDÆ contains thirty-six species, distributed among four genera: *Dictyna*, 14; *Lethia*, 5; *Titanœca*, 7; *Amaurobius*, 10. The family ENYOIDÆ comprises three genera and eleven species: *Ceto* (gen. nov.), 1; *Selamia*, 1; *Enyo*, 9; while the last of the families contained in the present volume, PHOLCIDÆ, has three genera and five species: *Holocnemus*, 1; *Pholcus*, 2; *Spermophora*, 2.

The above families are characterised at considerable length, and the diagnoses of genera are terse and good. An analytical table, with cross-references of the chief characters of all the families intended to be included in the work, is given at page 14; similar tables are also given of the genera and species; of some of the genera, separate tables of the males and females are given.

Of the twenty-three genera contained in this first volume, two—*Larinia* and *Ceto*, in the family Enyoidæ—are characterised as new. The species described as new are sixteen in number: six in the family Epëiridæ, genera *Larinia*, *Epëira*, and *Tetragnatha*; eight of Dictynidæ, in the genera *Dictyna*, *Lethia*, *Titanœca*, and *Amaurobius*; and two of Enyoidæ, in the genus *Enyo*. The semi-tropical character of the present portion of the spiders of France may be noted in the genera *Peltosoma*, *Argiope*, *Cyrtophora*, *Ceto*, *Selamia*, *Enyo*, *Holocnemus*, and *Spermophora*.

The plates illustrating this volume—three in number—are engraved on copper, and reflect great credit on both the artist (M. Simon himself) and the engraver. The figures, not too small, are yet remarkably clear, and all the minute points of form, structure, and pattern, are exceedingly well defined. One only regrets that the number of species illustrated should be, perhaps

necessarily, so limited; a type only of each genus being represented, with some few structural details of others. Figures, such as those here given, of all the species comprised in the work, would make it one of the most valuable and important faunistic works on spiders that have been published for many years. In spite, however, of this, probably inevitable, drawback, we hail this volume with great satisfaction, not only for what it is in itself, but as an earnest of what we hope is to follow before any great lapse of time. A second volume, containing four more families—Urocteoidæ, Agelenidæ, Thomisidæ, and Sparassidæ—is announced for April next; and it is considered that four or five volumes in the whole will complete the work.

ANTHROPOLOGICAL NOTES AND QUERIES

Notes and Queries on Anthropology, for the Use of Travellers and Residents in Uncivilised Lands. Published by a Committee appointed by the British Association for the Advancement of Science. (London: E. Stanford, 1874.)

WELL asked is half answered, and more problems escape solution because no one happens to propose them, than because of their real difficulty. To suggest suitable inquiries to the mind of a traveller or colonist as to the wild races he comes in contact with, is to start him on a course of ethnological investigation which may lead to excellent results. The plan of drawing up lists of such inquiries to be distributed among naval officers, missionaries, and others, is not new. The Ethnological Society of London issued a set years ago, which drew much information. An elaborate series of questions as to the North American tribes, answers to which constitute some of the best material in Schoolcraft's "Indian Tribes of the United States," is reprinted at the end of vol. i. of that work. The "Admiralty Manual of Scientific Inquiry" contains an ethnological section, first drawn up by Dr. Prichard, and since revised. The present publication issued by the British Association is far more complete than any of these earlier guides. The committee by whom it has been drawn up are Col. Lane Fox (secretary) Dr. Beddoe, Mr. Franks, Mr. F. Galton, Mr. E. W. Brabrook, Sir J. Lubbock, Sir Walter Elliot, Mr. Clements R. Markham, and Mr. E. B. Tylor. The first sections, relating to the physical constitution of man, are drawn up by Dr. Beddoe, who gives drawings and directions for measurement of skull and limbs, &c. It adds much to the value of the book that the eminent French anthropologist, Dr. Broca, has allowed his set of colour-types to be reproduced. By the aid of these tinted patches, the colour of skin, hair, and eyes in individuals of any race may be set down within a shade. Thus, instead of loosely describing a Peruvian Indian's complexion as copper-brown, it might be defined as between No. 42 and No. 43 of Broca's table. The section on archæology is by Col. Lane Fox, and contains cuts of the principal types of stone implements, contributed by Mr. John Evans, also an ideal representation of a valley, to show the position of the gravel beds above the present river-level, where travellers may be likely to find drift-implements. The sections on war, hunting, and ornamentation are also by Col. Fox; the latter article is especially interesting from the illustrations of the principal patterns used in barbaric ornamental carving, &c., such as the chevron, fret or key-border, plait or guilloche. Mr. Franks deals with the subjects of clothing, personal ornaments, pottery, &c.; Mr. Evans with weaving, basket-work, &c.; Mr. Galton with statistics; Sir J. Lubbock with relationships; Mr. Tylor with religion, mythology, language, customs, &c.; Prof. Busk with artificial deformations; Prof. Carl Engel (whom the printer has converted into *Cave* Engel) on music; Mr. Hyde Clarke on weights and measures, money, &c. The articles often contain not only leading questions, but introductions which state in few words what is known on their subjects.

We strongly recommend those who have friends within reach of uncivilised countries to send them out at once copies of this little manual. Being not a regular trade publication, but issued by a scientific body, it may very likely fall out of print when the first stock is exhausted.

OUR BOOK SHELF

Lessons in Elementary Botany. New Edition. By D. Oliver, F.L.S., F.R.S. (Macmillan and Co., 1874.)

THE new edition of this admirable little text-book deserves a word of notice. It is slightly enlarged, the additions principally dealing with the most important points in economic botany. The illustrations have been increased in number, and the few small errors which had crept into the first edition have been corrected. In the present state of our classificatory knowledge of flowering plants, it would be hardly possible to have a better guide than Prof. Oliver's "Lessons." Something, doubtless, will still have to be supplied by the oral instruction of the teacher. No series of natural objects ever was or ever will be quite comfortable when packed into a classification. The exposition of the term *perigynous*, for instance, requires that the pupils should be not exacting, but reasonable; there have been found even grown-up and advanced botanists who have allowed themselves to be sceptical about the application of the term to the corolla of the common Holly. They have even ventured to go so far as to wonder how the insertion of the corolla would differ in this case if it were *hypogynous*.

The few pages at the end of the book devoted to Cryptogams have been slightly enlarged, but are still not perhaps intended to more than indicate the existence of other types of vegetable life besides Phanerogams. If the criticism may be allowed (and it really seems ungracious in a case like the present), it would have been better not to apply the term Order to groups differing so widely in their relative diversity as, say, *Cyperaceæ* and *Gramineæ* on the one hand, and *Musci* and *Fungi* on the other. On no possible modern classificatory principles can such aggregates of organisms be regarded as equipollent or comparable. Then *Lichenes* can hardly be said to hold up its head as a distinct group with the same unimpeachableness that was the case five years ago.

LETTERS TO THE EDITOR

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications.*]

On the Northern Range of the Fallow Deer in Europe

THE essay, illustrated by woodcuts, on the existence of the Fallow Deer in Pleistocene times in England, in NATURE (vol. xi. p. 210), leaves no room for doubting that the antlers named in the books *Cervus brownii* and *Cervus somonensis*,